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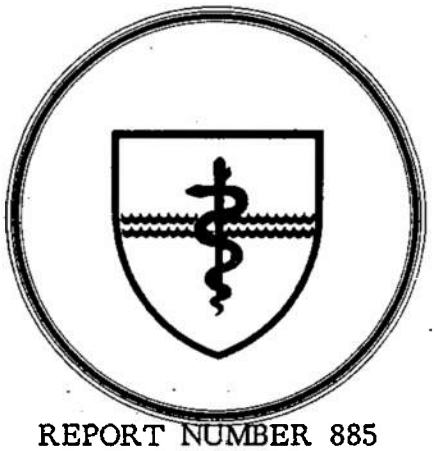

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HAND PREFERENCE AND THE MMPI PROFILES OF NUCLEAR SUBMARINERS

by

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HAND PREFERENCE AND THE MMPI PROFILES OF NUCLEAR SUBMARINERS[1]

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Summary.—Comparison of the MMPI profiles of the right-handed (874 or 87%), left-handed (107 or 11%), and the ambidextrous (27 or 2%) subgroups within a sample of 1008 nuclear submariners showed no differences whatsoever (10% level). Moreover, the distributions for educational achievement level and verbal aptitude test scores were identical for the 3 groups.

Historically, in many cultures, the left and right aspects of humans have had different meanings. The left, "sinister" in Latin, is characterized as the weak side and is associated with evil, the unclear, and treacherous. By comparison, the Latin for right, "dexter," is associated with skill, dexterity, adroitness, and is considered the strong side. In lower animals, right-handedness is found mainly in aggressive species such as rats. There is some evidence to indicate that left-handed children may be more creative than those who are right-handed (2). Many creative persons were left-handed: Beethoven, Leonardo da Vinci, Goethe, Michelangelo, and Nietzsche, to name a few.

On a more scientific level it is seen that anatomical symmetry but not functional symmetry characterizes humans. The left cerebral hemisphere appears to be associated with language production, while spatial tasks tend to be carried out by the right hemisphere. Handedness, assumed to be a reflection of cerebral dominance, has been shown to be related to a variety of maladjustive behaviors (1). One recent publication suggested that children who tend to draw circles in a clockwise direction may be more prone to develop schizophrenic symptoms at maturity than are those that circle left (2). Finally, Gur (6) presented quite substantial evidence for the relationship between left-hemisphere dysfunction and over activation in schizophrenics.

At still another level the literature is replete with findings suggestive of a variety of differences between left- and right-handed persons. For example, Levy (8) reported that left-handed graduate students had lower WAIS Performance IQs than right-handers. Similar differences were also reported for a sample of undergraduates (10), but no differences in Performance IQs were reported for handedness groups drawn at random from the population (11). Left-handers were reported to be inferior to right-handers on perceptual and motor skills (8) but they were found to be better, at least among architectural students, in designing spatial mazes (12). It has been reported that left- and

[1]Reprints may be requested from the first author at the following address: Box 900, USN Submarine Base, Groton, Conn. 06340. The assertions or opinions which appear in this paper are those of the authors and are not to be construed as the official views of the U.S.N. Medical Department.

mixed-handers are found in disproportionately large numbers in people with speech and reading disabilities (4, 13). Finally, the quality of social adjustment and perhaps the propensity for mental illness also may be related to handedness (9).

The range of equipment with right-handed bias is large: scissors, can openers, firearms, musical instruments, desk-chairs, and so on. "In any event, it is clear that left-handers do suffer prejudice and discrimination, both mechanical and social, in our right-handed world. Given that left-handers seem so poorly adapted to our right-handed world, and perhaps suffer additional cognitive deficits besides, one may wonder why they continue to survive" (5, p. 108).

Taken together, the psychobiological, cultural, and neuroanatomical differences between right- and left-sided persons suggest the plausibility of the assumption that the personality trait configurations of dextral and sinistral humans would likewise show differences reflecting the unavoidable handicaps imposed by a right-handed society upon this minority group. The purpose of this paper therefore emerges as a straightforward attempt to test this assumption.

METHOD

Perhaps the most widely used objective test of psychopathological trait patterns is the Minnesota Multiphasic Personality Inventory (14). An objective test of 566 items, the MMPI is made up of three validity scales designed to reflect the respondents' test-taking attitudes and 10 psychopathological subtests repeatedly validated in the literature to identify the same number of Kraepelinian nosological classes (14). The MMPI was administered to 1008 male submariners assigned to the nuclear submarines of the U.S. Navy. The test was administered in groups of four as part of a day-long medical examination. Each subject had completed a volunteer consent form and had received assurance of the anonymity of the data following its collection.

The mean age of the sample was 29 yr., with a standard deviation of 7. Hand preference was determined by a questionnaire item asking each subject which hand was used almost exclusively for skilled performance such as writing, pitching a baseball, and which foot was used to kick a football. Besides "left" or "right," a third choice "either left or right" was allowed on the questionnaire as a means of identifying the so-called ambidextrous person. The percentage distribution for handedness determined in this manner was 10.6% left, 86.7% right, and 2.7% ambidextrous.

RESULTS

At the outset it is to be noted that 11% of the submariner sample ($N = 1008$) indicated that they are essentially left-handed. Whereas the estimates of the incidence of left-handedness have been reported to vary from 1% to 30% (7), recent studies place the incidence in the range of 11 to 14% (3). Thus the 10.6% incidence of left-handedness found in the present sample of nuclear submariners may be construed as representative of the general population.

In general, the results were essentially negative for differences among the three hand-preference groups. For example, the mean General Classification Test scores and standard deviation were 60.4 and 7.3 for the right-handed, 60.9

and 6.4 for the left-handed, and 60.1 and 8.3 for the ambidextrous. Similarly, the mean years of formal education and standard deviation were 12.8 and 1.7 yr. for right-handed men, 12.8 and 1.6 for the left-handed and 12.5 and 1.2 for those who were ambidextrous. With $df = 2/1005$, neither of the two F ratios approached the 10% level of significance.

The MMPI data for the 13 subtests in raw score form are contained in Table 1. Again, with $df = 2/1005$ none of the 13 F ratios approached significance even at the 10% level of confidence. In fact, scale for scale, the small absolute differences among the distribution statistics for the three hand preference groups appear negligible. Most assuredly, insofar as the MMPI profiles are concerned, the three submariner samples appear to have been drawn from the same population.

TABLE 1

MMPI Subtest Means and Standard Deviations Derived from a Sample of Nuclear Submariners with Different Hand Preferences

MMPI Subtests	Right Hand		Left Hand		Ambidextrous	
	M	*SD*	*M*	*SD*	*M*	*SD*
N	874		107		27	
Lie Scale	3.8*	2.0	3.7	1.8	3.9	2.0
F-scale	4.6	4.1	4.6	3.9	4.8	3.1
K-scale	15.2	4.9	15.2	4.7	14.6	4.7
Hypochondriasis	12.7	3.6	12.9	3.5	11.8	3.2
Depression	19.4	4.8	19.5	5.0	19.6	4.7
Hysteria	20.7	4.4	21.0	4.4	19.8	3.8
Psychopathic Deviate	22.4	4.7	22.2	5.0	22.0	3.1
Masculinity-Femininity	24.9	4.7	25.4	5.1	25.4	3.2
Paranoia	9.1	3.1	9.2	3.2	9.6	2.3
Psychasthenia	25.3	5.5	25.7	5.5	24.1	4.7
Schizophrenia	24.9	6.3	25.0	7.4	23.6	3.6
Hypomania	20.4	4.4	20.1	4.6	20.1	4.1
Social Introversion	24.4	8.8	24.5	8.9	25.7	8.2

*Calculated from MMPI raw scores with *K*-corrections.

Should these essentially negative results have been expected? In a predominantly right-handed world, one might expect the left-handed person to experience more frustration and emotional distress than his right-handed counterpart. Accordingly, it is perhaps surprising that significant differences were not found between handedness groups on such personality dimensions as trait anxiety as measured by the MMPI subtest, Psychasthenia or on Social Withdrawal, two of the most reliable MMPI scales (14).

The absence of personality differences between the handedness groups of nuclear submariners may have resulted from any one or more of at least three reasons: (a) Handedness, at least as indicated by stated hand preference, prob-

ably is not a truly dichotomous variable; (b) because of the comprehensive psychiatric screening procedure applied to nuclear submariner candidates, the resultant population contains many biases, such as those resulting from the elimination of those candidates who are emotionally unstable or those showing character or cognitive abnormalities (15). Thus, it is possible that the interrelationships of some MMPI patterns and the hand preferences of a random sample of men drawn from the general population might be considerably different than those found in this study. And (c) finally, if replicable in a comparable civilian population, the negative findings reported in this study may simply indicate that left- and right-handed adult men do in fact have virtually identical patterns of personality traits as measured by the MMPI.

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